A RESEARCH PROJECT

In partial fulfillment of the requirements for the degree MMed (Obstetrics and Gynaecology in the Department of Obstetrics and Gynaecology in the faculty of Health Sciences at the Nelson R Mandela School of Medicine (NRMSM) at the University of Kwa-Zulu Natal

UNIVERSITY OF
KWAZULU-NATAL

AN AUDIT OF PERIPARTUM HYSTERECTOMY AT THE PIETERMARITZBURG COMPLEX OF HOSPITALS

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PIETERMARITZBURG COMPLEX OF HOSPITALS

HEALTH
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This is to certify that this commentary is the sole and exclusive work of the candidate.

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ABBREVIATIONS

Peripartum Hysterectomy (PH)

Caesarean Hysterectomy (C/H)

Total Abdominal Hysterectomy (TAH)

Subtotal Abdominal Hysterectomy (SAH)

Intensive Care Unit (ICU)

Vaginal Birth After Caesarean (VBAC)

Gestational Diabetes Mellitus (GDM)

Confidence Interval (CI)

Normal Vaginal Delivery (NVD)

World Health Organization (WHO)

Antiretroviral Drugs (ARV Drugs)

Ante-Natal Care (ANC)

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ABSTRACT

RATIONALE OF THE STUDY

To carry out a retrospective chart review of all patients who had a peripartum hysterectomy in hospitals at different levels of health care in the Pietermaritzburg Hospital Complex to examine the incidence and indications for peripartum hysterectomy.

METHODS

The charts of 120 cases of peripartum hysterectomy operations performed between January 2003 and January 2008 in the Pietermaritzburg hospital complex of University of KZN were analysed retrospectively. The total number of deliveries were 48 964. The traditional indications, risk factors and associated complications were revisited to determine if there have been changes in current obstetric practice.

RESULTS

The overall incidence of peripartum hysterectomy at the Pietermaritzburg complex of hospital was 0.25/1000 deliveries (95% C1 0.2 – 2.9). Uterine atony, bleeding abruption placentae, placentae praevia, uterine rupture following induction and extension of uterine incision into the uterine arteries comprised 87.9% of the indications for peripartum hysterectomy. By far, the most common complications were wound infection and haemorrhage due to difficult haemostasis. Both comprised 61% of complications, others were bladder injury and renal failure. Coagulopathy occurred in 16.7% of cases of whom 2 died due to massive uncontrollable haemorrhage and 26.7% cases had relaparatomy.

There were 13.3% of haemorrhagic shock and 5% developed septic shock. All the patients had blood transfusion, 13.3% of patients received platelets in addition to blood. The results showed that 55.8% had previous caesarean sections while 12.5% had VBAC. There were 75.8% live babies.

CONCLUSION

The review noted that there has not been a significant change in the incidence and indications for peripartum hysterectomy. The incidence of peripartum hysterectomy in the study 0.25/1000 compared favourably with the findings from similar studies in different parts of the world. Worldwide the incidence of PH ranges from 0.2 to 5.09/1000 deliveries, in our study the incidence was 0.25/1000.

INTRODUCTION

Peripartum hysterectomy(PH) by definition is one in which there is surgical removal of the uterus with or without the ovaries anytime between labour and six weeks post delivery. It could be undertaken as an emergency operation if it occurs within 24hours of a normal vaginal delivery(NVD) or caesarean section (C/S). In an event of uncontrollable obstetric haemorrhage in which conservative surgical and medical intervention measures have failed PH could be performed. Some conservative measures include fundal massage, bimanual uterine compression, others include use of administration of oxytocin, prostaglandin, curettage of the placental bed and systematic pelvic devascularization of blood supply to the uterus.

Peripartum hysterectomy could also be performed as a scheduled procedure. Most of the literature on this subject describe the experience of developed countries (Rahman et al., 2008). Very few reports have been published from resource poor settings where this operation is performed more frequently. In the past, few decades, the most common indications for PH were uterine atony and rupture (Al-Sibai et al., 1987; Chestnut et al., 1985; Lachman et al., 1985). Abnormal placental adherence and placenta praevia are emerging as the major indications for PH in recent reports, attributable mainly to the rise in C/S observed over the past two decades (Kastner et al., 2002; Miller et al., 1997; Zelop et al., 1993).

Peripartum Hysterectomy and caesarean section rates are important indices of quality of obstetrics practice. The reported caesarean section rates has been around 32%-34% for

the two decades predominantly in the resource limited settings and under resourced countries (Jou et al., 2008). World Health Organization (WHO) recommends 10-15%. In general PH is performed in the setting of life threatening conditions.

However, worldwide, the incidence of PH has been reported to range from 0.20 to 5.09/1000 deliveries (Ayabasoglu et al., 2007).Gazle et al.,(2006) reviewed the charts of all cases of PH including previous obstetric history, details of index pregnancy, indications for PH outcome and infant morbidity and mortality. They found that the overall rate of PH was 87 of 108, 154 or 0.8 per 1000 deliveries. According to their findings, the primary indications for PH were uterine atony (32 of 87, 37%). Forty six patients (53%) were admitted into the Intensive Care Unit (ICU). The rate of PH did not seem to increase overtime. They concluded that their population-based study found abnormal placentation to be the main indication for PH.

In a retrospect cohort study, Jou et al., (2002) investigated all women with singleton pregnancy admitted for delivery. There were 287 PH in 214237 singleton deliveries (0.13%). Caesarean delivery,vaginal delivery after caesarean(VBAC) and repeat caesarean delivery had higher hysterectomy rates than vaginal delivery 12.13%, 5.12% and 3.84% respectively. Pregnancies complicated with placenta praevia, gestational diabetes mellitus (GDM) and premature labour were associated with significantly increased risks for PH ($p<0.05$). Jou et al., (2002) concluded that risk factors for PH included caesarean delivery, VBAC, repeat caesarean, placenta praevia, GDM and premature labour.

Rahman et al., (2008) reported that 43 PH were performed of a total of 67,668 deliveries in a University Teaching Hospital over a period of 25 years giving an incidence of 0.64/1000 deliveries; 31 uterine procedures followed C/S and 12 were performed for haemorrhage following vaginal delivery. The common indications for hysterectomy were abnormal placentation (39.5%), uterine atony (23.3%), and uterine rupture (23.3%) and haemorrhage during C/S (11.6%). In their series, they noted that advancing maternal age and parity were risk factors for PH. They performed subtotal hysterectomy in 72.1% cases which they believed was a quicker and safer procedure than total PH in desperately ill patients. They reported 5 (11.6%) maternal deaths due to massive haemorrhage in their series.

In another series, Kayabasoglu et al.,(2008), evaluated the incidence, risk factors, indications, outcomes and complications of emergency PH performed after caesarean and vaginal deliveries. It was a retrospective study that examined 28 cases of emergency PH performed between February 2001 and February 2007 at the Istanbul Goztepe Training and Research Hospital. Their findings showed that the overall incidence of emergency PH is 0.37/1000 deliveries. Abnormal placental adherence and uterine atony comprised 85% of the indications for PH. Post operative maternal morbidity occurred in 15 cases (54%) and most patients had a febrile morbidity and depression. Seven patients underwent PH due to consumptive coagulopathy. There was one maternal death (4%) and five perinatal deaths (18%). The maternal death was due to consumptive coagulopathy associated with abruption placenta. All the patients received blood transfusions. The mean number of post operative hospitalization was 7 days. They concluded that PH is

still a dramatic life-saving operation with high risks. The most common reason for abnormal placental adherence is previous uterine procedures.

Knight et al., (2008), showed, in their series, in a one year period between February 2005 and February 2006 that there were 318 cases of PH in 160,000 deliveries studied, giving an incidence of 4.1 per 1000 births. The maternal mortality was 0.6%,previous C/S contributed 3.52%, maternal age over 35 years was 2.42%, parity of three or more was 2.03%, previous manual placental removal was 12.5%; previous myomectomy was 14.0% and twin gestation contributed 6.30%. They noted that the risk associated with PH was higher with increasing number of previous C/S. The risk was 2.14% with one previous C/S and 18.6% with two or more C/S. Women undergoing a first C/S were also at increased risk 7.13% from haemorrhage. In their conclusion they noted that PH is strongly associated with previous C/S and the risk rises with increasing number of previous C/S, maternal age over 35 years and parity greater than 3.

Aboelmagd et al., (1987) in a study conducted from January 1980 to December 1984,reported on 86483 deliveries and found 25 PH at a maternity hospital in Kuwait. The indications for PH were placental disorders (64%), uterine rupture (28%) and extension of the lower segment scar during C/S. The incidence of emergency PH increased with age and parity Aboelmagd et al., (1987). Post operative morbidity was higher with subtotal hysterectomy(SAH) than total abdominal hysterectomy(TAH). The commonest post-operative complication was urinary tract infection. There was one maternal death from consumptive coagulopathy associated with intra uterine fetal death.

Mesleh et al., (1997) reviewed 54166 deliveries including 6119 (11.3%) C/S. Emergency PH for obstetric haemorrhage was carried out in 16 cases (0.3/1000) deliveries. The operations followed major degrees of placenta praevia in 12 (75%) cases and atonic post partum haemorrhage in 4 (25%) cases. All patients required blood transfusion. There was one neonatal and one maternal death. Although the operations were reported as straight forward, bladder injury occurred in five cases (0.31%) which were repaired with no residual damage. Placenta accreta was confirmed by histology in 12 (75%) patients. In their conclusion they alerted all obstetricians to be aware of the strong association between scarred uterus, placenta praevia and placenta accreta which can be very adherent and difficult to remove causing torrential and uncontrollable bleeding necessitating hysterectomy. In their opinion, the operation should be performed by an experienced obstetrician before the patient's condition becomes critical.

Terry et al., (2001) in their study sought to evaluate the morbidity and cost associated with planned emergency PH in a residency setting. The authors, also evaluated planned hysterectomy compared with delivery and subsequent hysterectomy. The charts of 64 patients who under went emergency or planned PH were reviewed and comparisons were made in the following areas: gravidity and parity, number of prior C/S, fetal weight, blood loss, number of transfused blood units, length of stay in the hospital, hospital charges and indications for hysterectomy.

Planned PH resulted in lower hospital costs compared with emergency PH. Residents who participated in planned PH felt more prepared when an occasion for emergency PH arose at a later date than those who had not participated in any PH. In situations in which a patient has a concurrent gynaecologic indication for surgery, a planned PH is an option because it has less morbidity than an emergency PH. A retrospective review based on data of 67 patients undergoing PH over 10 years was undertaken by Gurkan et al.,(1998). Comparison of two different time periods regarding the incidence and the indications of PH were made. Their findings revealed that the number of patients with PH in the first 5 years of the study period (1985-1989) was 43 while in last 5 years (1990-1994);the number was only 24. The incidence of PH during (1985-1989) was 1 in 2495 deliveries and the most common indication for PH was uterine atony (42%) followed by placenta accreta (25.5%) and uterine rupture (21%). On the other hand, the incidence of PH during (1990-1994) was 1 in 4228 deliveries and the indications of PH was slightly different from group one as placenta accreta (41.7%) was the commonest indication followed by uterine atony (29.2%). They concluded that their study showed that over the last decade in review, the incidence of PH in obstetric practice had declined in their hospital due to availability of high standard obstetric care and liberal use of C/S in at risk deliveries, better controlled use of oxytocin and bilateral internal iliac artery ligation.

A report of hospital based data over a 9 year period published by Carol et al., (1993) in which they sought to evaluate the clinical indications of PH by demographic characteristics and reproductive history. Obstetrics records of all deliveries at Brigham and Women's Hospital between October 1, 1983 and July 31, 1991, all women

undergoing PH were identified. They calculated the crude and adjusted incidence rates, conducted statistical tests of linear trends and heterogeneity, and observed the clinical indications preceding the onset of this procedure. There were 117 cases of PH identified during this period giving an overall incidence of PH as 1.55/1000 deliveries. The rate increased with increasing parity and was significantly influenced by placenta praevia and a history of C/S. The incidence increased from 1 in 143 deliveries in multiparous women with placenta praevia to 1 in 4 deliveries in multiparous women with four or more deliveries with placenta praevia.

Likewise, the incidence increased from 1 in 143 deliveries in women with one prior live birth and a prior C/S to 1 in 14 deliveries in multiparous women with four or more deliveries with a history of a prior C/S. Both trends were significantly high ($P<0.0001$). Abnormal adherent placentation was the most common cause preceding PH (64%, $P< 0.001$), with uterine atony accounting for 21%. Although no maternal deaths occurred, maternal morbidity remained high, including post operative infection 58 (50%), intra operative urologic injury in 10 patients (9%), and need for transfusion in 102 patients (87%). In their concluding remark, they noted that the data identified abnormal adherent placentation as the primary cause of PH. The data also illustrated how the incidence of PH increases significantly with increasing parity especially in a prior C/S. Maternal morbidity remained high although no maternal deaths occurred.

Eltabbakh and Watson (1995), reviewed cases of postpartum hysterectomy in their series in respect of indications indications, risk factors and complications and compared them

with cases of emergency C/S. This was a retrospective chart review of 20 cases of postpartum hysterectomy and 20 cases of emergency C/S performed at Sinai Samaritan Medical Centre, Milwaukee, Wisconsin, between January 1984 and January 1994. Emergency postpartum hysterectomies were compared with emergency C/S regarding obstetric history, placental location, operative time, blood loss, blood transfusion, intra and post operative complications and length of hospitalization.

Emergency hysterectomies were reviewed according to their indications, incidence and complications. Pathological diagnoses of the hysterectomy specimens were reviewed. In analysing their results, they found that placenta accreta was the most common indication for emergency postpartum hysterectomy. Prior C/S and/or placenta praevia were risk factors. Emergency postpartum hysterectomy were associated with longer operative times, greater blood loss, more transfusion, post operative complications re-laparotomies and longer hospitalization than emergency C/S. In concluding their study, they stated that emergency postpartum hysterectomy is associated with significant blood loss, need for transfusion, post operative complications and longer hospitalization partly because of its indications. The combination of prior C/S and current placenta praevia should alert the obstetrician that an emergency postpartum hysterectomy may be needed.

During the 13 months of the United Kingdom Obstetric Surveillance System (UKOSS) study (Knight M et al., 2007), 315 women were reported to have had a Peripartum hysterectomy to control haemorrhage, a rate of 41.0 per 100 000 maternities with a 95% (C.I) from 36.6 to 45.8 per 100, 000 maternities. This suggests that more than 60 women

undergo peripartum hysterectomy for each woman who dies from haemorrhage. Of women requiring hysterectomy, 53% were reported to have uterine atony and 38% had a morbidly adherent placenta: one of placenta accreta, percreta or in increta. The management of these women was variable.

In Denmark between 1995 and 2002, 152 patients had a hysterectomy due to bleeding (0.23 per 1000 deliveries). Two patients died and 16 required re-operation. There was a significantly increased incidence of peripartum hysterectomy following caesarean section compared to the incidence of following vaginal delivery (P<0001, relative risk (RR) 11.1 C1 7.9 – 15.6), (Sakse A, et al., 2007).

CAESEREAN HYSTERECTOMY

Historically, the first documented hysterectomy performed in the United States by Horatio Storer in 1866 (Plauche, 1988; Eltabbakh and Watson, 1995) and reported in 1869 (Park and Duff, 1980). Although the uterus was removed successfully, the patient died on the third day after surgery (Park and Duff, 1980). Seven years later, Eduardo Porro of Milan described the first caesarean hysterectomy in which both infant and mother survived (Park and Duff, 1980). The operation was performed in July 1871 (Plauche, 1988) and details were published in 1876 (Park and Duff, 1980) within several months of Porro's report, several more cases were reported with modifications of Porro's technique.

The operation was originally devised as a surgical attempt to manage life-threatening obstetric haemorrhage and uterine sepsis after prolonged labour (Haynes and Martini, Thonet, 1986). By the 1950's it was being undertaken as an elective procedure for minor indications such as sterilization (Thonet, 1986), then fell into disrepute due to the association of this procedure with excessive blood loss and risk of ureteric injury. Advances in blood transfusion and the use of blood products to correct coagulopathy as well as advances in the conservative's treatment of uterine atony (e.g. prostaglandins) have greatly reduced the need for hysterectomy in cases of uterine atony and severe placental abruptio. Subsequently abnormal placenta adherence (placenta accreta, percreta or increta) among others have emerged as a major indication for most peripartum hysterectomy in current obstetric practice.

RATIONALE OF THE STUDY

Although an uncommon procedure, peripartum hysterectomy whether as an emergency or a scheduled procedure, represents a catastrophic (and sometimes fatal) end to a pregnancy for any woman. Women who require peripartum hysterectomy are managed with a range of other therapies including intensive care support. The resources required to manage these women therefore extend well beyond the surgical costs.

In addition, as medical practice is constantly changing and new discoveries come to the fore, lessons learnt from this study may help in revising the existing clinical protocol for the emergency management of severe obstetric conditions.

AIM OF STUDY

To carry out a retrospective chart review of all patients who had a peripartum hysterectomy in hospitals at different levels of health care in the Pietermaritzburg Hospital Complex to examine the incident and indications for perpartum hyrestoctomy.

METHODS

The demographic data, reproductive medical histories and indications for hysterectomies were comprehensively inspected in the medical files of all patients who had peripartum hysterectomy from the three hospitals namely, Grey's, Edendale and Northdale from January 2003 to January 2008. Maternal characteristics such as age, gravidity and parity, gestational age, previous birth weights and previous uterine procedures were examined. The type of delivery, indications for caesarean section, additional procedures, type of hysterectomy, peri-operative complications need for blood transfusion number of post operative hospitalization days, fetal morbidity and mortality were studied.

All deliveries during this period were enumerated from hospital based delivery registry that maintains demographic and reproductive medical history information on all deliveries performed at the three named hospitals. All patients that had elective peripartum hysterectomy for gynaecologic indications were not included in the study.

RESULTS

During the period under review there were 10 548 deliveries at Grey's Hospital and a total of 44 (36.7%) peripartum hysterectomies were performed, while at Edendale Hospital there were 76 (63.3%) peripartum hysterectomies and 38 416 deliveries. There were only three PH performed at Northdale Hospital during the period under review. However, these files were destroyed having been preserved for the stipulated five-year period.

TABLE 1: DEMOGRAPHIC DATA OF ALL PERIPARTUM HYSTERECTOMIES AT THE TWO HEALTH FACILITIES

NO OF HYSTERECTOMIES (n= 120)

	NUMBER
GREYS	44 (36.7%)
EDENDALE HOSPITAL	76 (63.3%)
MEAN AGE (Yrs), SD AND RANGE	30.4 +/- 5.17; (19 – 40 Yrs.)
PARITY:MEAN; SD; RANGE	3 +/- 1.0 ; (0-6)
GRAVIDITY; MEAN; SD; RANGE	3 +/- 1.0 ; (1-7)
GESTATIONAL AGE OF DELIVERY; MEAN; SD; RANGE	37 +/- 2.2; (22- 42 wks)
BOOKED	97 (80.8%)
UNBOOKED	23 (19.29)
NO. OF DAYS IN HOSPITAL; MEAN; SD; RANGE	8+/- 3 ; (4-26)
HAEMOGLOBIN (on admission): MEAN; SD; RANGE	9.7 +/- 1.7 (6.1 – 13)
TEMPERATURE (on admission): MEAN; SD; RANGE	36.7 +/- 0.7 (36 -39)
PULSE (on admission): MEANS; SD; RANGE	99 +/- 12 (36-148)
BLOOD PRESSURE: MEAN; SD;	118 +/- 28 (70-197)

RANGE	
PREVIOUS CAESAREAN SECTION	41 (34.2%)
WEIGHT (KG) MEAN; SD; RANGE	81.2 +/- 17 (52 – 122 kg)

The demographic and medical characteristics of all the patients' studied are described in Table 1. The table shows that the mean age of the patients was 30.4 years with a range of (19-40 yrs) giving a standard deviation (SD) of +/- 5.17. The mean parity was 3, the range was (0-6) and SD +/-1.0. The table also shows that the mean gravidity was 3.9, a range of (1-7) and SD of +/-1.0, the mean gestational at delivery was given as 37 weeks, a range of (22-42 wks) and a SD of +/-2.2. The table also shows that 97 (80.8%) were booked patients, while 23 (19.2%) were unbooked. The mean haemoglobin on admission in the table was 9.7 g/dl, a range of (6.1-13) with a SD of +/- 1.7, mean temperature was 36.7, range was (36 - 39) and a SD of +/- 0.7. The mean pulse rate was 99/minute, while the range was (36 - 148) and SD was +/- 12. The mean systolic blood pressure was 118 mm Hg and a range of (70 - 197) with a SD of +/- 28. In the same table (Table 1), 41 (34.3%) had previous caesarean section (C/S).

TABLE 2: MODE OF DELIVERY

MODE	**NUMBER**
NORMAL VAGINAL DELIVERY (NVD)	52 (43.3 %)
CAESAREAN SECTION (C/S)(emergencies)	67 (55.8%)
RECORDS NOT AVAILABLE	1 (0.8%)
VAGINAL BIRTH AFTER CAESAREAN SECTION (VBAC) (undergoing NVD)	15 (12.5%)

As shown in Table 2, 52 (43.3%) cases delivered vaginally while 67 (55.8%) delivered by C/S. There were 15 patients (12.5%) that had vaginal birth after caesarean section (VBAC).

TABLE 3: NEONATAL OUTCOMES

	NUMBER
ALIVE	91 (75.8%)
STILL BIRTH	28 (23.3%)
RECORDS OF 1 BABY (Not available)	1 (0.8%)
NO ADMITTED TO NICU	13 (10.8%)
NO OF DAYS IN NICU 2	 6 (5.0%)
3	5 (4.2 %)
5	1 (0.8%)
7	1 (0.8%

NICU – Neonatal Intensive Care Unit

In the study, the characteristics of neonatal outcome showed that 91 babies (75.8%) were delivered alive and 28 cases (23.3%) were still born (Table 3). Thirteen babies (10.8%) were admitted to neonatal intensive care unit (NICU), 6 (5.0%) spent 2 days in NICU, 5(4.2%) patients were in NICU for 3 days, one patient (0.8%) were in NICU for 5 days, only 1 patient (0.8%) spent 7 days.

TABLE 4: INDICATIONS FOR PERIPARTUM HYSTERECTOMY (n = 120)

INDICATIONS	NUMBER
BLEEDING ABRUPTIO PLACENTAE	23 (19.2%)
PLACENTA PRAEVIA	18 (15.0 %)
SEPSIS-ANTEPARTUM	1 (0.8%)
SEPSIS-POSTPARTUM	21 (17.5%)
UTERINE RUPTURE IN LABOUR SPONTANEOUS	2 (1.7%)
UTERINE RUPTURE FOLLOWING INDUCTION	11 (9.2%)
UTERINE RUPTURE (VBAC)	2 (1.7%)
UTERINE RUPTURE FOLLOWING OXYTOCIN AUGMENTATION	1 (0.8 %)
UTERINE RUPTURE UNBOOKED (PREVIOUS VBAC)	2 (3.3 %)
UTERINE RUPTURE (DD&C)	4 (0.8 %)
SPONTANEOUS RUPTURE MYOMECTOMY	1 (0.8 %)
UTERINE ATONY (PPH)	26 (21.7%)
TRAUMA – MOTOR VEHICLE (MVA)	5 (4.2 %)
MAJOR BLOOD VESSEL INJURY	1 (0.8 %)
MISSING DATA ON CHART	1 (0.8 %)

Table 4 illustrates the distributions of clinical indications for peripartum hysterectomy. As shown in the table, uterine atony was the leading indication for peripartum hysterectomy 26 (21.7%) cases, closely followed by bleeding abruptio placenta 23 cases (19.2%). Post partum sepsis was the third most common cause of peripartum hysterectomy with a significant contribution of 21 cases (17.5%). Uterine rupture following induction occurred in 11 cases (9.2%).

TABLE 5: HAEMORRHAGIC SHOCK

	NUMBER
NO OF PATIENTS WITH HAEMORRHAGIC SHOCK	16 (13.3%)
NO OF PATIENTS WITH SEPTIC SHOCK	6 (5.0%)
NO OF UNITS OF BLOOD TRANSFUSED	
2	4 (3.3%)
3	40 (3.3%)
4	39 (32.5%)
5	20 (20%)
6	15 (12.6%)
7	1 (0.8%)
RECORDS NOT AVAILABLE	1 (0.8%)
NO OF PATIENTS THAT RECEIVED PLATELET TRANSFUSION	16 (13.3%)

Sixteen (13.3%) patients developed hemorrhagic shock and 6 (5.0%) had septic shock. Forty (33.3%) patients were transfused with 3 units of packed cells, 39 (32.5%) had 4 units of packed cells, 20 (20.0%) had 5 units of blood transfusion. Fifteen (12.6%) patients had 6 units of packed cells, another patient had 7 units of packed cells. Sixteen patients (13.3%) were transfused with platelets.

TABLE 6: COMPLICATIONS

COMPLICATIONS	NUMBER
RENAL FAILURE	5(4.2%)
BLADDER INJURY	6(5.0%)
URETERIC INJURY	4(3.3%)
BOWEL INJURY	2(1.7%)
DIFFICULTY HAEMOSTASIS	36(30.2%)
WOUND INFECTION	37(30.8%)
THROMBOEMBOLISM	2(1.7%)
PNEUMONIA	1(0.8%)
COAGULOPATHY	20(16.7%)
RELAPARATOMY (RE – LAP) AFTER	
HYSTERECTOMY	32(26.7%)
RE-LAP - INTRA-ABDOMINAL BLEEDING	4(3.3%)
- WASH OUT	8(6.7%)
- REMOVAL OF PACK	10(8.3%)

Table 6 indicates that wound infections were the commonest complication of peripartum hysterectomy in our series. Following wound infections; 37 (30.8%), there were 36 (30.3%) cases in which haemostasis was difficult to achieve. Other complications were coagulopathy 20 (16.7%), bladder injury occurred in 6 cases (5.0%) patients. Renal failure occurred in 5 cases (4.2%). A total number of 32 (26.7%) patients had relaparotomy after hysterectomy. Of these numbers 4 (3.3%) were for intra-abdominal bleeding, 8 (6.70) for wash out and 10 (8.3%) for removal of packs.

TABLE 7: CO-MORBID DISEASE

CO-MORBIDITY	NUMBER
PULMONARY TUBERCULOSIS (PTB)	3(2.5%)
T.B ABDOMEN	-
AIDS	13(10.8%)

The presence of co-morbid infections is summarised in Table 7. It shows that there were 17 patients (14.2%) who had pre-eclampsia, 13 cases (10.8%) AIDS, 11 (9.2%) patients suffered hypertension, 6 (5.0%) had diabetes mellitus and only 3 (2.5%) had pulmonary tuberculosis (PTB).

TABLE 8: DECISION FOR LAPAROTOMY

SURGEON	**NUMBER**
PART-TIME CONSULTANT	19(15.8%)
FULL TIME CONSULTANT	24(20.0%)
SURGEON : FULL-TIME CONSULTANT	77(64.2%)
: PART-TIME CONSULTANT	2(0.8%)
: REGISTRAR ALONE	4(3.3%)
: REGISTRAR SUPERVISED	88(73.3%)
BY CONSULTANT	26(21.7%)

The vast majority of decisions for laparotomy was taken by a full time consultant 77 (64.2%). This is illustrated in Table 8 while part time consultants took the decision for laparotomy in 24 (20.0%) of the cases. The table also demonstrates that in 19 cases (15.8%), the registrar decided that patients required laparotomy and 88 of these operations (73.3%) were undertaken by the registrar is training alone, 26 (21.7%) of them performed the operation under the supervision of a consultant.

TABLE 9: ADMISSION TO INTENSIVE CARE UNIT (ICU)

PATIENTS ADMITTED TO ICU	19(15.8%)
MEDIAN NO OF DAYS ON VENTILATOR; SD; RANGE	(0-6)
MEDIAN NO OF DAYS TO HIGH CARE SD; RANGE	(1-14)

Table 9 shows that 19 (15.8%) patients were admitted to Intensive Care Unit (ICU). The mean number of days on ventilator was 0.4 with a SD +/-1 and a range of (0-6 days). In the High Care section of the ward, the mean number of days was 0.46 with a SD of +/-2.4 and a range of (1-14days).

In the study, there were 13 (10.8%) patients who had one previous caesarean section, 24 (20.0%) had two previous caesarean section, while 4 cases (3.3%) had three previous caesarean sections. Reactive syphilis serology was (RPR) present in 32 (26.6%) of patients. Therapeutic antibiotics was administered on 111 (92.5%) patients, 7 (5.8%) had prophylactic treatment. There were 12 (10.0%) that received steroids 16 (3.3%) patients and inotropes, prophylactic anticoagulants were given in 7(5.8%) of cases who underwent peripartum hysterectomy while 20(16.7%) received therapeutic treatment for coagulopathy.

DISCUSSION

The incidence of peripartum hysterectomy worldwide has been reported as ranging from 0.2 to 5.09/1000 deliveries (Kayabosglu et al., 2007). This compares favorably with the findings at the two health facilities, Greys and Edendale complex of hospitals which gave an incidence of peripartum hysterectomy of 0.25/1000 deliveries (95% CI 02-2.9). Rates of peripartum hysterectomy reported by Langdana et al., (2001) and Young et al., (2006) were 0.64/1000 and 0.45/1000 respectively. Much higher rates have been reported from other countries e.g 0.78/1000 deliveries in Croatia (Kastner et al., 2002); 2.3/1000 in South Korea (Habek et al., 2007) and 5.09/1000 in Turkey (Bai et al., 2003). In the Netherlands, an incidence of 0.33/1000 has been reported (Zeteroglu et al., 2003) and 1.43/1000 (Kwee et al., 2006) in the USA.

In recent years an increased incidence of obstetric hysterectomy has been linked to the high caesarean section rate (Young et al., 2006). In Young et al., (2006) study, 26 patients had previous uterine scars and among them nine had placenta accreta, and nine had placenta praevia as indications for the hysterectomy. Of the nine cases with placenta accreta, five were noted in the last 6 years of the study period requiring hysterectomy. This could well be due to the increased numbers of patients with multiple caesarean sections falling pregnant (Young et al., 2006). In addition to high rates of C/S and abnormal placentation which may increase the risk of peripartum hysterectomy, a number of factors could account for the wide range of incidences in peripartum hysterectomy noted between developed countries and resource poor settings as seen in developing

countries. One of the reasons could be due to logistic problems and geographic location of the higher level care hospitals. The vast majority of people in the rural communities do not have access to private transport due to low social economic status, and therefore, depend heavily on the public government owned ambulance services. The delays caused by these over burdened ambulance services in transporting women with obstetric problems during emergency situations may increase the incidence of obstetric complications such as uterine atony or rupture following a traumatic home delivery which inevitably would lead to higher rates of peripartum hysterectomy if they make the trip alive to the hospital. World-wide indications for peripartum hysterectomy appear not to be in transition. Traditionally uterine atony was most common (Rahman et al., 2008) .

Aboelmagd et al., (1986) reported that the commonest cause of peripartum hysterectomy was placental disorder causing intractable bleeding in 16 cases (64%). Placenta preavia occurred in 8 cases (32%), placenta accreta in 5 cases (20%) and abruptio placenta in 3 cases (12%). Abruptio placentae with a couvelaire uterus was the single most common indication in 96 of 200 cases reported by Barclay (1969), with ruptured uterus in 45, placenta praevia in 15 and placenta accrete in 3, whereas Sturdee and Rushton (1986) found morbidly adherent placenta was the cause of persistent haemorrhage in 16 of 35 cases and 8 of these were also placenta praevia. These findings above conform with the findings in our study with uterine atony 26 (21.7%) as the commonest indication for peripartum hysterectomy. This was followed very closely by abruptio placentae 23

(19.2%), placenta praevia contributed 18 (15.0%) of the cases and uterine rupture 11 cases (9.2%). There was histological evidence of placenta accreta in one patient.

The most common surgical complication after haemorrhage and infection in this study was injury to the bladder. Many patients will have a previous caesarean section causing adhesions of the bladder to the lower uterine segment, so that mobilization of the bladder may be difficult. Injudicious pressure with a swab can easily result in a tear of the bladder wall that may not be recognized, especially in the presence of haemorrhage. However, when a bladder injury is identified at operation, repaired properly and the bladder drained post-operatively for 8-10 days, fistula formation is rare (Park and Duff; 1980). A sharp dissection technique using scissors to free the bladder is therefore recommended, keeping in the mid –line as far as possible so as to avoid the highly vascular bladder pillars. Initial dissection should be just far enough allow safe ligation of the uterine arteries and veins, and further dissection, which can cause severe venous oozing, should be delayed until required to allow the ureters to fall away laterally, prior to securing the transverse cervical ligaments and vaginal angles. The broad vaginal vaults and cervix add to the risk of ureteric injury during the final stages of hysterectomy thus identification of the ureters in the base of the broad ligament and palpation below the uterine vessels up to the bladder is particularly advisable. When there has been uterine rupture or extension of the caesarean incision laterally to involve the uterine vessels the ureters may be difficult to visualize so that palpation is essential. However, in such circumstances the risk of bladder or ureteric injury is so much greater (Hayes and Martins; 1979; Mickal et al., 1969) that ligation of the internal iliac artery, which can

control the hemorrhage may be preferable to hysterectomy (Park and Duff; 1980 ; Pelosi et al., 1975). Bladder injury is one of the common intra-operative complications (Yucel et al., 2006) and (Habek et al., 2007).

Knight et al., (2007) also reported bladder injury 67 (21%) of cases, while 14 cases (5%) suffered ureteric injury. In their report, bladder damage was more likely in women with placenta accreta. Forna et al., 2007 reported febrile morbidity as the most common complication in their series (39%). In the literature the rates of febrile morbidity ranging from 21 to 40% have been reported (Selo-Ojeme et al., 2005) and (El – Jallad et al., 2004). Forna et al., (2007), in the same report, found one case (3%) of wound dehiscence. Aboelmagd et al., (1986) noted in their study that urinary infection, wound infection, pneumonia and paralytic ileus were common complications. Other complications stated in the report were wound dehiscence, thrombophlebitis, one case of vesico-vaginal fistula and one case of maternal death. The commonest post operative complication was urinary tract infection. Reported intra-operative and post operative complications as shown by Carolyn et al., (1993) underscore the need for good surgical technique and critical care management. These authors showed that urologic injuries are common and usually related to scarring from previous caesarean deliveries encountered when dissecting the bladder from the lower uterine segment. Ten patients (9%) sustained urologic injuries, of these nine sustained cystotomy and three sustained ureteral injury that required stenting. Invasion of the bladder by placenta which can also lead to cystotomy or ureteral damage. In the same report peri-operative haemorrhage occurred in the vast majority of patients requiring blood transfusion. No figures were given for

this complications. In their findings, (Zelop et al., 1993) reported that urological injuries are usually related to scarring from previous caesarean deliveries encountered when dissecting the bladder from the lower uterine segment. Five patients in their series sustained bladder injury with no ureteric injury.

The common complications reported by majority of the authors are in agreement with the findings in this study. There were 36 cases of haemorrhage 30 (30.2%), wound infection occurred in 37 (30.8%) patients, bladder injury occurred in 6 cases (5.0%) while 5 patients (4.2%) went into renal failure. The second most common complication which was difficult haemostasis 36 (30.2%) could be a direct reflection of excessive bleeding due to abruptio placenta which was the second most common indication for peripartum hysterectomy. A high number of hysterectomies following induction of labour was an important finding. Seven cases (5.8%) were referrals from the district hospitals where uterine rupture were discovered at caesarean section. The abdominal cavity was packed with gauze and sent to our center and arrived several hours later. At the second operation, hysterectomy was performed due to extensive uterine laceration and haermorrhage. The 4 (3.3%) that occurred in our center were due to severe post-partum haermorrhage following normal vaginal delivery after induction of labour.

Relaparatomy was performed in one case (Furan et al., 2007). The rate of relaparatomy in the study of Zeteroglu et al., (2003) was 13%. Kwee et al., (2006) reported a rate of 25%, five of which were because of the need to remove the intra-abdominal gauzes. Carolyn et al., (1993) reported that three patients required re-exploration because of

bleeding of these, one required post operative angiographic embolisation to facilitate haemostasis. In my study there were 10 (8.3%) cases of relaparatomy to remove abdominal pack, 8 (6.7%) cases were for washout, while 4 (3.3%) cases were for intra abdominal bleeding. In Knight et al's., (2007) series, they reported that 62 women (20%) returned to theatre for a second operation after their hysterectomy, 44 (14%)for further surgery to control bleeding and 18 (6%) for repair of damage to other organs sustained at hysterectomy.

Aboelmagd et al., (1986) reported one maternal death from severe post operative haemorrhage, secondary to consumptive coagulopathy. Gurkan et al., (1998) also reported two maternal deaths from consumptive coagulopathy. In Furkan's series there was only one maternal death (4%) (Furkan et al., 2007), due to consumptive coagulopathy after placental abruption. In the literature, rates of maternal mortality from 0- 17% have been reported by (Zeteroglu et al., 2003) and (Zelop et al., 1993). Knight et al., 2007 reported two case fatalities (0.6%). The findings were similar to those in this study, in which there were also two maternal deaths from consumptive coagulopathy as a result of intractable bleeding following abruption placentae. There were five maternal deaths in the series by Rahman et al., (2008) giving a maternal mortality rate of 11.6%. This is comparable with 11.1% and 12.5% quoted by other authors in the literature (Okobenin et al., 2003, Young et al., 2006). A lower rate of 4.5% has been quoted by Zorlu et al., (1998) and a much higher rate of 20% by Hamsho and Alaska (1996).

The answer as to how to improve the health outcome of our pregnant mothers and reduce the hazards of child bearing to a minimum and reshape the future of obstetric lies in constant researches such as this and periodic review of the existing referral protocols with a view to improving the standard of obstetric practice offered to our mothers to be. There is a great need to give feedback to the referring hospitals on any patient referred with obstetric complications whether or not the complication culminated in peripartum hysterectomy highlighting in such feedbacks the missed opportunities in the hope that such opportunities will be identified timeously in future. It is a long standing problem that the ambulance services fall short of providing adequate transport services to the pregnant patients. This age long logistics problem can be overcome by assigning some of these ambulances only to pregnant mothers with obstetric problems that require transport to a health care facility as quickly as possible as it is currently practiced in the Western Cape. These ambulances are referred to as "flying squad", this way the unnecessary delays of transporting pregnant patients with complications will be significantly reduced.

Operative techniques that might reduce urologic complications include careful sharp dissection of bladder in the midline to mobilize the bladder flap, placing clamps and sutures directly against side walls of the uterus and cervix, peri-operative cystoscopy with ureteral stent placement and checking the integrity of the bladder by filling a coloured solution. Advances in pharmacological modalities for the treatment of uterine atony eg prostaglandins, intramuscular carboprost and rectal misoprostol introduced in the past 10 years (Selo-Ojeme., 2002) appear to have lowered the numbers of peripartum hysterectomy and maternal death due to post partum haemorrhage. Uterine and

hypogastric artery ligation and insertion of the B-Lynch suture have also contributed to a reduction of hysterectomy performed in the management of uterine atony. The advent of modern blood banking services, antibiotics, safe anaesthesia and surgical technique was a major contributing factor in improving the outcome, and reducing maternal and fetal morbidity and mortality to a minimum. Despite this, the most important step in prevention of major post partum haemorrhage for clinicians is recognizing and assessing women at risk (Sarah et al., 2008) although even perfect management of haemorrhage cannot always prevent surgery. Given that atony is a major contributor to the pathology, newer management options, such as the B-Lynch and other compression sutures may play an important role in preventing haemorrhage.

CONCLUSION

In conclusion, uterine atony, massive haemorrhage due to abruptio placenta, post partum sepsis placenta praevia and uterine rupture emerged in this study as the leading causes of PH. Similarly the complications mirrored the indications very closely as demonstrated in the tables with difficult haemostasis, wound infections, renal failure, ureteric and bladder injury as the main complications. These findings reflect the current trend in modern obstetric practice in resource poor settings especially in Sub-Saharan Africa.

In the institutions under review, the obstetrician will initiate management of patients undergoing peripartum hysterectomy but the team will expand to include a collaborative approach involving the anaesthesiologists, physicians trained in Intensive Care Medicine and the social worker.

With larger numbers of study it should be borne in mind that emergency surgery to save the life of the mother may still be necessary in catastrophic situations and will always remain a possibility in modern obstetric practice. In the majority of patients, anticipation, a high index of suspicion, prompt resuscitation and early surgical intervention by a skilled operator will reduce patient morbidity and mortality.

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AN AUDIT OF PERIPARTUM HYSTERECTOMY AT THE GREY'S / EDENDALE / NORTHDALE COMPLEX OF HOSPITALS

INTRODUCTION

Peripartum hysterectomy is the surgical removal of the uterus with or without the ovaries any time between labour and six weeks post delivery. It could be undertaken as an emergency operation if it occurs within 24 hours of a normal vaginal or caesarean delivery in uncontrollable obstetric haemorrhage in which conservative surgical and medical intervention measures such as fundal massage, bimanual uterine compression, use of blood products, administration of oxytocin and prostaglandins, curettage of the placental bed and selective ligation of the ascending uterine artery and internal iliac artery have failed necessitating an urgent definitive resuscitative intervention to prevent likely death of the mother.

Peripartum hysterectomy could also be performed as a scheduled procedure where the woman has developed overwhelming potentially fatal sepsis following a normal vaginal delivery or caesarean delivery and conservative medical treatment such as the use of antibiotics have failed to combat the infection.

Worldwide, the incidence of Peripartum hysterectomy ranges from 0.20 to 5.09 per 1000 deliveries. Peripartum hysterectomy and caesarean delivery rates are important indices of medical quality care for obstetric practice, therefore this figure may vary depending on the quality of obstetric care offered to pregnant women in different countries.

Most of the literature on this subject describes the experience of well resourced countries. Very few reports have been published from under resourced countries where this operation is performed more frequently, often with inadequate facilities thereby resulting in significant morbidity and mortality.

In the past, the most common indications of Peripartum hysterectomy were uterine atony and uterine rupture. Abnormal placental adherence and placenta praevia are emerging as the indications of peripartum hysterectomy in recent reports, attributed mainly to the rise in caesarean section deliveries observed over the past two decades. The recommended caesarean deliveries rate by World Health Organizations (WHO) is 10% - 15 %. Some countries such as Taiwan reports caesarean section deliveries as high as 32 – 34%. In Grey's and Edendale Hospitals, the caesarean delivery rate is reported as high as 30 – 32%.

AIM

The aim of this audit is to estimate the incidence, rate, risk factors, indications, complications, maternal morbidity and mortality (outcome) associated with obstetric peripartum hysterectomy performed in these hospitals between January 2003 to January 2008.

METHODOLOGY

The demographic data, reproductive medical histories and indications for hysterectomies will be comprehensively inspected in the medical files of all patients who had a peripartum hysterectomy from 3 hospitals, viz. Grey's, Edendale and Northdale from January 2003 to January 2008. Maternal characteristics such as age, gravidity and parity, gestational age, previous birth weights and previous uterine procedures, will be examined. The type of delivery, indication of caesarean section, additional procedures, type of hysterectomy, peri-operative complications, need for blood transfusions, number of post operative hospitalization days, fetal morbidity and mortality will be studied (annexure1: data sheet).

STUDY POPULATION

The study population will comprise all women who underwent peripartum hysterectomy whether as an emergency measure or scheduled procedure.

SAMPLING

The patients will be sampled form the total number of deliveries both normal and vaginal deliveries, caesarean sections and hysterectomies that occurred within the five year period in review.

DEFINITION

The peripartum period will be define as that period between viable pregnancies, 28 weeks gestation and greater and the end of puerperium (12 weeks following delivery). An emergency hysterectomy is one carried out as a life-saving procedure within 24 hours of the incident being diagnosed, while a scheduled hysterectomy will be a hysterectomy planned as a “next day / next morning” procedure.

DATA COLLECTION

Patients’ operative notes and case files that are available will be obtained from the relevant departments. These include the doctors notes, from lying – in wards, nurses progress reports, theatre records, intensive care charts, patient admission records, neonatal intensive care charts (NICU) and the mortuary.

DATA ANALYSIS

All data collected which will represent patient’s characteristics ranging from demographics, medical and surgical information, complications, neonatal and maternal outcome will be analyzed.

ETHICAL CLEARANCE

Ethical clearance will be sought from the Biomedical Ethics Research Committee before commencing the study. Permission will also be obtained from the relevant hospital authorities.

LIMITATIONS

There may be limitations in this study as a result of illegible writing, missing information or lost patients records. To minimize this limitation, all information gathered from all the different sources will be matched for correctness and accuracy before analysis.

PUBLIC HEALTH IMPACT

Although an uncommon procedure, peripartum hysterectomy, whether an emergency of scheduled procedure, represents a catastrophic (and sometimes fatal) end to a pregnancy for any women, regardless of whether she considers her family to be complete. Women who require a peripartum hysterectomy are managed with a range of other therapies including intensive care support. The resources required to manage these women therefore extend well beyond surgical costs.

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A STUDY OF PERIPARTUM HYSTERECTOMY PERFORMED AT GREY'S, EDENDALE AND NORTHDALE HOSPITALS. GREY'S AND EDENDALE ARE TERTIARY AND SECONDARY LEVEL TEACHING HOSPITALS RESPECTIVELY, WHILE NORTHDALE IS A DISTRICT HOSPITAL ALL SITUATED IN PIETERMARITZBURG METROPOLITAN AREA PROVIDING OBSTETRIC CARE FOR PREGNANT MOTHERS.

DATA SHEET

STUDY NO. [_____ / _____ / _____]

HOSPITAL SITE :

GREYS = 1

EDENDALE = 2 [_____]

NORTHDALE = 3

REFERRED: YES = 1 ,NO = 2 [_____]

IF YES, STATE NAME OF HOSPITAL _____

⇒ AGE (YRS) [_____ / _____]

⇒ PARITY [_____]

⇒ GRAVIDITY [_____]

⇒ BOOKED/UNBOOKED YES=1, NO=2 [_____]

⇒ GESTATIONAL AGE AT DELIVERY [_____ / _____]

⇒ DATE OF ADMISSION (dd/mm/yy) [_____ / _____ / _____]

⇒ DATE OF DISCHARGE [_____ / _____ / _____]

⇒ NO OF DAYS IN HOSPITAL [_____ / _____]

⇒ HB ON ADMISSION (g/dl) [_____ / _____]

⇒ TEMPERATURE ON ADMISSION (^{0}C) [_____ / _____]

⇒ PULSE ON ADMISSION [_____ / _____ / _____]

⇒ BP ON ADMISSION [_____ / _____ / _____] [_____ / _____ / _____]

⇒ PREVIOUS C/S : YES =1,NO=2 [_____]

IF YES: NO. OF C/S [_____]

V BAC : YES = 1, NO= 2 [_____]

MATERNAL

⇒ WEIGHT (Kg) [_____ / _____ / _____]

⇒ DATE OF DELIVERY (dd/mm/yy) [_____ / _____ / _____]

⇒ MODE OF DELIVERY [_____]
NVD=1, C/S =2, FORCEPS = 3, VENTOUSE = 4

⇒ BABY OUTCOME : ALIVE = 1, SB = 2 [_____]

⇒ BABY ADMISSION TO NICU YES = 1, NO = 2 [_____]

IF YES: STATE NO. OF DAYS [_____ / _____]

ASSOCIATED OBSTETRIC COMPLICATIONS:

⇒ BLEEDING ABRUPTIO PLACENTA = 1

⇒ BLEEDING PLACENTA PRAEVIA = 2

⇒ SEPSIS-ANTEPARTUM = 3 [_____]

⇒ SEPSIS POST PARTUM = 4

⇒ UTERINE RUPTURE IN LABOUR SPONTANEOUS = 5

⇒ UTERINE RUPTURE FOLLOWING INDUCTION = 6

⇒ IF YES, STATE WHETHER:

- ◆ CYTOTEC ALONE = 1
- ◆ CYTOTEC WITH PITOCIN = 2 [_____]
- ◆ PITOCIN ALONE = 3
- ◆ OTHERS (PRANDIN, PREPADIL _____

⇒ UTERINE FOLLOWING VBAC = 7

⇒ UTERINE RUPTURE FOLLOWING OXYTOCIN AUGMENTATION = 8

⇒ UTERINE RUPTURE UNBOOKED (PREVIOUS C/S) = 9

⇒ UTERINE RUPTURE UNBOOKED SPONTANEOUS (ANTEPARTUM) = 10

⇒ IF SPONTANEOUS RUPTURE : PREVIOUS EVACUATION (DDC) = 11
PREVIOUS MYOMECTOMY = 12

⇒ ATONIC UTERUS - PPH = 13

⇒ TRAUMA - PPH (motor vehicle accident – MVA) = 14

⇒ OTHERS = 15 (STATE _____)

◆ DATE OF OPERATION (dd/mm/yy) [_____ / _____ / _____]

◆ TIME OF OPERATION [_____h _____]

⇒ SHOCK - HEMORRHAGIC YES= 1, NO = 2 [_____]

⇒ SEPTIC SHOCK YES = 1, NO = 2 [_____]

⇒ NO OF UNITS OF BLOOD TRANSFUSION

⇒ PLATELETS YES = 1, NO = 2 [_____]

⇒ WR STATUS YES = 1, NO = 2 [_____]

SURGICAL PROCEDURE AT LAPAROTOMY

⇒ HYSTERECTOMY(emergency) YES = 1; NO = 2 [_____]

⇒ IF YES
-TAH ALONE (ie tubes and ovaries conserved) = 1 [_____]
-TAH + BSO = 2

⇒ IF YES,STATE REASON FOR OOPHORECTOMY

⇒ REPAIR OF UTERUS YES = 1; NO = 2 [_____]

⇒ IF REPAIR

⇒ WASHOUTS - YES = 1, NO = 2 [_____]

⇒ ABDOMINAL/ VAGINAL DRAINS YES = 1 , NO = 2 [_____]

⇒ WOUND DRAINS - YES = 1, NO = 2 [_____]

⇒ DURATION OF ANAESTHESIA - (HOURS) [_____]

CO MORBID DISEASE YES = 1; NO = 2

⇒ TB CHEST [_____]

⇒ TB ABDOMEN [_____]

⇒ AIDS [_____]

DECISION MAKING FOR LAPAROTOMY

WHO MADE DECISION?

⇒ REGISTRAR = 1
⇒ CONSUTANT - PART-TIME = 2
- FULL TIME = 3 [_____]

TIME INTERVAL BETWEEN DECISION AND LAPAROTOMY (HRS/MINS)
[_____ / _____]

SURGEON

- FULL TIME = 1
- PART TIME = 2 [_____]
- REGISTRAR ALONE = 3
- REGISTRAR SUPERVISED BY CONSULTANT = 4

OTHER PROCEDURES (PRIOR OR FOLLOWING HYSTERECTOMY)

⇒ EMBOLIZATION YES = 1, NO = 2 [_____]
⇒ X-RAYS YES = 1, NO = 2 [_____]
⇒ SONAR YES = 1, NO = 2 [_____]
⇒ MRI YES = 1, NO = 2 [_____]
⇒ STATE RESULTS _____

ADMISSION TO ICU YES = 1, NO = 2 [_____]
STATE REASONS _____

⇒ NO. OF DAYS ON VENTILATOR [_____ / _____]
⇒ NO. OF DAY IN ICU [_____ / _____]
⇒ ADMISSION TO HIGH CARE YES = 1, NO = 2 [_____]
⇒ NO. OF DAYS [_____ / _____]

MATERNAL OUTCOME

⇒ COMPLETE RECOVERY = 1
⇒ DISCHARGED WITH WOUND INFECTION = 2
⇒ RENAL DIALYSIS = 3 [_____]
⇒ HORMONAL REPLACEMENT THERAPY = 4
⇒ DEATH = 5
STATE OTHER MORBIDITY _____

COMPLICATIONS

⇒ RENAL FAILURE YES = 1, NO = 2 [_____]

⇒ BLADDER INJURY YES = 1, NO = 2 [_____]

⇒ URETERIC INJURY YES = 1, NO = 2 [_____]

⇒ BOWEL INJURY YES = 1, NO = 2 [_____]

⇒ DIFFICULTY IN HAEMOSTASIS YES = 1, NO = 2 [_____]

⇒ WOUND INFECTION YES = 1, NO = 2 [_____]

⇒ THROMBOEMBOLISM YES = 1, NO = 2 [_____]

⇒ PNEUMONIA

⇒ COAGULOPATHY YES = 1, NO = 2 [_____]

IF YES, - PRIOR TO SURGERY = 1
- DURING SURGERY = 2
- AFTER SURGERY = 3 [_____]

IF YES TO ANY COMPLICATION, STATE MANAGEMENT AND OUTCOME:

_____

_____

_____

RELAPAROTOMY FOLLOWING HYSTERECTOMY, YES = 1, NO = 2

IF YES, STATE REASON:
⇒ INTRA-ABDOMINAL BLEEDING = 1
⇒ WASHOUT ROUTINE = 2
⇒ REMOVAL OF PACK = 3 [_____]
⇒ CONTINUING SEPSIS = 4
⇒ OTHERS STATE = 5

MEDICATION - PROPHYLACTIC ANTIBIOTICS YES = 1, NO = 2

⇒ THERAPEUTIC ANTIBIOTICS [_____]
⇒ STEROIDS [_____]
⇒ INOTROPES [_____]
⇒ PROPHYLACTIC ANTI COAGULANTS [_____]